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What We Talk About When We Talk About Hope: A Prototype Analysis

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Although hope is a well-studied topic, there is no consensus on its definition. Using a prototype analysis (a bottom-up approach collecting laypeople's views on hope), the present research defines hope and provides insights into its associations with other related constructs. Study 1 identified a list of features of hope derived from characteristics generated by laypeople in the Netherlands and the United States when asked to think about hope. Study 2 determined the centrality of each of these features of hope, where the most frequently mentioned features were classified as "central features," whereas the less frequently as "peripheral features." Studies 3–5 then tested the validity of this classification and showed that central features (compared with peripheral ones) were more often recalled and recognized (Study 3), were classified as a feature of hope more quickly (Study 4), and were more representative in autobiographical situations involving hope (Study 5). Our findings are in part consistent with the definitions of hope reported in previous literature, and suggest in addition that some features deserve more attention than before. Based on our findings and previous literature, we propose the following core elements of hope: *belief, positive*, *future*, *desire*, and *possibility*. Accordingly, we propose the working definition that hope is a *belief that a positive future outcome is possible* combined with *a desire for that outcome*. As our research provides a more nuanced understanding of hope and its associations with other related constructs, we hope the current findings will contribute to future research on this important topic.

Keywords: hope, faith, desire, prototype analysis, emotion

Hope is ubiquitous in people's lives. People hope that the weather will be sunny tomorrow, they hope to be admitted to the school of their choice, they hope for recovery, even after a bad prognosis, and now in early 2020, they hope the pandemic coronavirus could vanish ASAP and no more people will die from it. Hope is also ubiquitous in academic literature. We looked in Web of Science (2020) from 1990 to 2020 for articles with the word "hope" in the title and found 22,906 articles.[1] To put this in perspective, the frequency with which basic emotions such as "happy" (7,173), "sad" (2,900), or "anger" (7,453) are used in article titles, is much lower. Furthermore, the interest in hope is broad, as it appears frequently in the titles of journal articles across various different disciplines such as religion (1,408), medicine (1,335), history (1,148), and multidisciplinary sciences (1,121, see Figure 1). The prevalence of hope in daily life and academic research clearly suggests that hope is an important concept. But what are people talking about when they talk about hope?

What Is Hope?

In the Oxford English Dictionary (2019) (hereafter OED) hope is defined as "an expectation of something desired" or "desire combined with expectation." This definition, however, does not match perfectly with various early academic interpretations of hope. Aquinas (1265/2006) and Hobbes (1651/1987) argued that, beyond mere desire, the *attainability* of the desired "something" is a necessary condition to activate hope; Spinoza (1667/1994) defined hope as an emotion, and more specifically, a *positive* emotion (i.e., "pleasure"); Hume (1738) and Spinoza (1667/1994) both believed that hope roots in *uncertainty*, a characteristic that is not mentioned in the dictionary definition at all. The definitions provided by these early philosophers not only differ from the OED (2019) definition but also differ from each other.

In psychology, a similar variety in definitions and conceptualizations of hope can be found (cf. Bruininks & Malle, 2005). To get a better idea about this variation, we summarized various definitions of hope in Table 1. Specifically, we searched for journal articles that contained hope in their title, keywords, or abstract (using Web of Science, 2020) from a selected list of

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All studies were preregistered and the data sets are accessible on the Open Science Framework: (https://osf.io/hsrwg/?view_only=af0e0179bc394bf090dfecaa7f6fb1f1).

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[1] Updated on May 31, 2020.

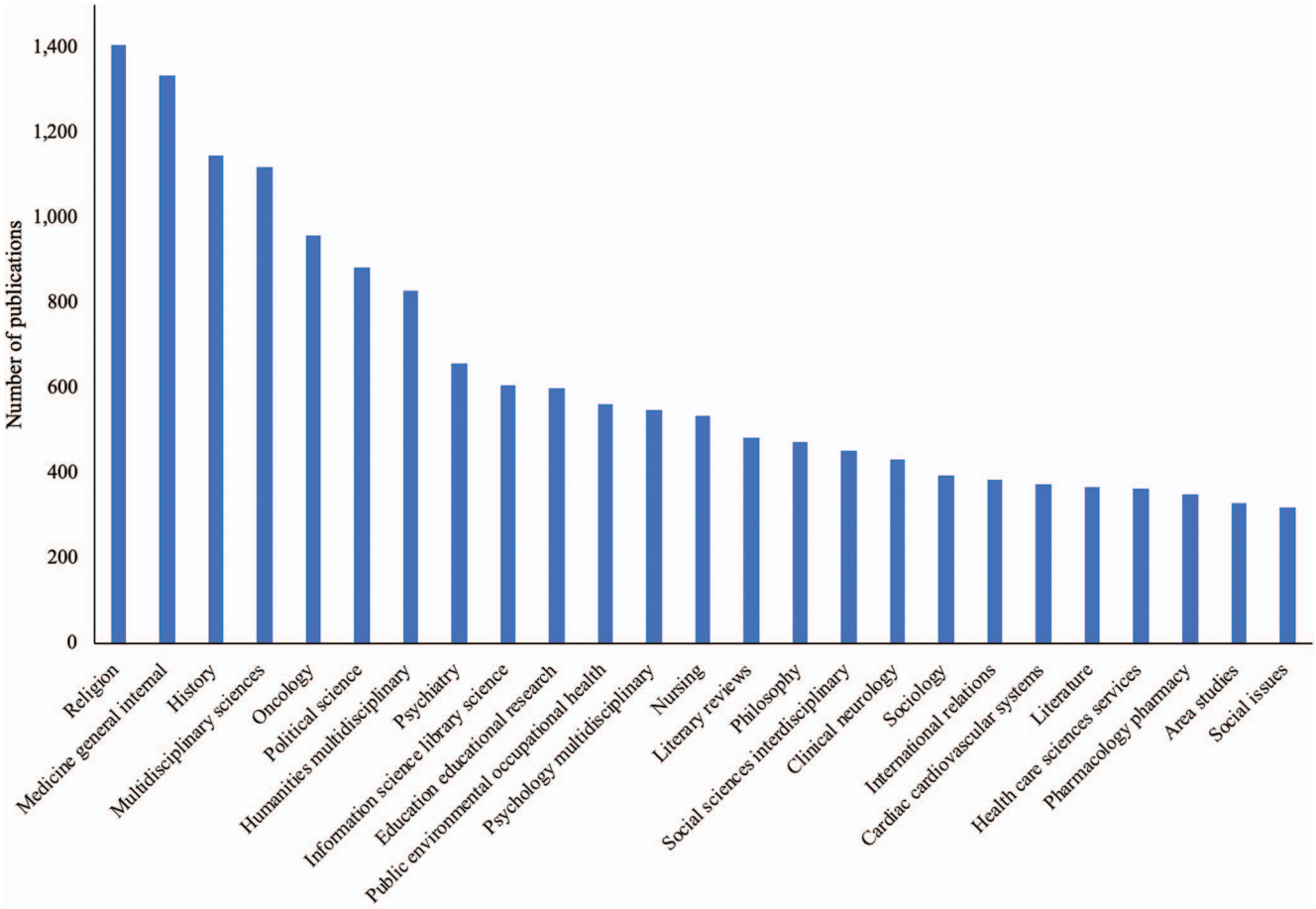

Figure 1. The number of publications in Web of Science (2020) with the word "hope" in the title, in different disciplines: 1900–2020. See the online article for the color version of this figure.

psychology journals.[2] Among the 104 publications that we found, 21 provide a specific definition of hope. We listed these 21 publications and the keywords used in their definitions in Table 1 in a chronological order.

Table 1 clearly illustrates that the definitions of hope vary from article to article, indicating a low consensus of what hope is. The table shows furthermore that when psychologists study hope they focus on different characteristics and aspects of hope. For instance, one primary discrepancy is that some researchers regard hope as a cognition, while others regard it as an emotion; this difference coincides with the discrepancy in other related aspects of hope which will be discussed later in this paragraph. Specifically, Snyder, Cheavens, and Sympson (1997) treat hope as a cognition—"a thinking process that involves an agency and pathways for one's goals" (p. 107)—and thus further define hope with keywords including "goal-related" features such as "motivation," "capability," and "determination." However, other researchers regard hope purely as an emotion (e.g., Bruininks & Malle, 2005; Hasan-Aslih, Pliskin, van Zomeren, Halperin, & Saguy, 2019) and define it using keywords such as "wish" and "desire." Another discrepancy deals with the relation between hope and "possibility." Specifically, many researchers mention "possibility" in their definitions of hope (e.g., Halevy, 2017; Kavussanu, Dewar, & Boardley, 2014; Nelissen, 2017; Whitson, Galinsky, & Kay, 2015), but Snyder et al. (1991, 1996) do not do that.

Moreover, by summarizing the keywords of hope, we observe opposing opinions on aspects suggested such as to whether hope is generated by perceived control or a lack of control (Bruininks & Malle, 2005). Specifically, given that some (e.g., Snyder et al., 1991) argue that hope stems from one's agency and pathway thinking, hope is believed to appear only when individuals have control. At the same time, others argue that hope stems from situational difficulties, where hope is believed to become important when there is a lack of control (e.g., Averill, Catlin, & Chon, 1990).

To sum up, despite extensive research on hope, it is still not clear what we talk about when we talk about hope. The large variety in how researchers define hope leads to different perspectives on how to investigate the concept of hope. Therefore, we

[2] We selected the following journals (in alphabetical order): *Annual Review of Psychology, Cognition and Emotion, Emotion, Journal of Experimental Social Psychology, Journal of Personality and Social Psychology, Motivation and Emotion, Personality and Social Psychology Bulletin, Personality and Social Psychology Review, Psychological Bulletin, Perspectives of Psychological Science, Psychological Review, Psychological Science, Social Psychological and Personality Science.*

Table 1

Keywords Defining Hope Observed in Selected Psychology Journals (From 1900 to 2020; Vertically Ordered by Chronological Sequence and Horizontally Ordered From Most Frequently Mentioned Feature to the Least, Web of Science, 2020)

Article	Emotion	Positive	Goals	Cognition	Possibility	Future	Desire	Pathways: Methods/ means	Capability/ ability	Agency	Meaningful/ important	Uncertainty	Expectation	Improvements	Belief	Actions	Imagination	Wish	Determination	Motivation	(Specific) Outcomes	Realization/ achievements	Change/ be different
Elliott et al., 1991		x	x					x	x	x									x	x			
Snyder et al., 1991; Snyder et al., 1996				x				x	x	x					x	x							
Curry, Snyder, Cook, Ruby, & Rehm, 1997			x					x	x	x													
Bruininks & Malle, 2005	x	x				x					x										x		
Ai, Park, Huang, Rodgers, & Tice, 2007 (based on Snyder, Cheavens, & Sympson, 1997)		x	x	x		x		x	x				x						x				
Davis & Hicks, 2013 (based on Snyder et al., 1997)			x	x			x	x		x										x			
Cohen-Chen, Halperin, Crisp, & Gross, 2014	x		x								x					x							
Kavussanu, Dewar, & Boardley, 2014					x									x									
Cohen-Chen, Crisp, & Halperin, 2015	x			x		x								x									
Whitson, Galinsky, & Kay, 2015	x	x			x																		
Leshem, Klar, & Flores, 2016			x									x	x					x					

(*table continues*)

Table 1 (*continued*)

Article	Emotion	Positive	Goals	Cognition	Possibility	Future	Desire	Pathways: Methods/ means	Capability/ ability	Agency	Meaningful/ important	Uncertainty	Expectation	Improvements	Belief	Actions	Imagination	Wish	Determination	Motivation	(Specific) Outcomes	Realization/ achievements	Change/ be different
Cohen-Chen, Crisp, & Halperin, 2017	x	x		x		x	x										x						
Wenzel, Anvari, de Vel-Palumbo, & Bury, 2017		x			x								x		x						x	x	
Halevy, 2017	x	x										x											
Cohen-Chen & Van Zomeren, 2018	x		x	x	x	x					x						x						x
Bury, Wenzel, & Woodyatt, 2016; Bury, Wenzel, & Woodyatt, 2018					x		x				x	x										x	
Hasan-Aslih et al., 2019 (based on Lazarus, 1999 and Smith & Lazarus, 1990)	x						x							x									
Cohen-Chen, Van Kleef, Crisp, & Halperin, 2019		x			x	x	x								x			x					

believe that in order to identify the core elements of hope and to distinguish hope from other concepts, a systematic understanding of the importance of relevant constructs is needed. We conducted a prototype analysis to cater to these demands.

Why Do We Need a Prototype Analysis?

When a clear definition of a construct is lacking, a prototype analysis can be useful. Unlike dictionary definitions that often provide boundary conditions to classify whether a construct satisfies all the "rules" to the defined concept, prototype analyses generate a list of features that assemble some prototypical images of the target concept. We use the example of a "chair" to illustrate the benefits of prototypical analyses (cf. Seuntjens, Zeelenberg, Breugelmans, & Van de Ven, 2015). The OED (2019) defines a chair as "a seat for one person; now the common name for the movable four-legged seat." However, when searching for pictures of "chair" online, one easily finds many chairs having three legs or even no legs but a single base. What's more, some chairs are obviously for more than one person. As such, these real chairs are not "chairs" according to the OED (2019) definition, but they are considered chairs by most people. This illustrates that it is difficult to define even a simple construct, such as a chair, not to mention a complex and fuzzy one.

Prototype analyses enable people to define a construct that cannot be simply distinguished by absolute boundary conditions, by using a list of prototypical features. Particularly, when defining some emotion-related constructs such as greed, love, gratitude, and nostalgia, previous researchers have often successfully adopted a prototype analysis (e.g., Elshout, Nelissen, & Van Beest, 2015; Fehr, 1988; Fitness & Fletcher, 1993; Hepper, Ritchie, Sedikides, & Wildschut, 2012; Lambert, Graham, & Fincham, 2009; Seuntjens et al., 2015). In the present research, we follow this tradition and apply a prototype analysis to understand the concept of hope.

A prototype analysis is a bottom-up approach that collects laypeople's views of constructs by having them generate features of hope, and then tests the importance of these features empirically. This method is complementary to top-down approaches that base its conceptualization on small-sample interviews or researchers' theorization. Top-down approaches can be helpful because they immediately provide the essence of the research based on the researchers' critical thinking. However, they may sometimes be subjective (e.g., due to its reliance on researchers' interpretations of small-sample interview results) and too specific to the research at hand. Taking hope as an example, medical researchers might have different ideas of what hope is from educational researchers, because the concept of hope in medical domains is for instance derived from interviews with severely ill patients (e.g., Cutcliffe & Zinck, 2011), which might be quite different from interviews with students (e.g., Scioli, Ricci, Nyugen, & Scioli, 2011).

The study of hope so far relies heavily on top-down approaches: For example, of the 21 journal articles listed in Table 1, only one article (i.e., Bruininks & Malle, 2005) adopted a bottom-up approach to define hope. In their Study 1, participants were asked "How would you describe hope?" The answers were combined with preexisting ideas from the authors' and previous research (Averill et al., 1990; Snyder et al., 1991), to create a list of hope features. In the book *Rules of Hope* Averill, Catlin, and Chon (1990) also used a bottom-up approach by asking lay people to generate features of hope. These features were however derived by asking participants to think about something they want or desire, but not hope for, and about something they want *and* hope for. Notwithstanding the importance of these findings, by implying that desire and wanting are separate to the construct of hope, this approach was not free from a preexisting theoretical perspective and thus not fully bottom-up. Here, instead, a prototype analysis was used, as it is a bottom-up technique free from any a priori theories or opinions about hope, which can provide new insights that are fully data driven.

Moreover, a prototype analysis is not only needed to overcome the issues prevalent in top-down approaches, but such an analysis is useful because it generates an extensive list of features of the target concept. As such, it is expected to provide a more nuanced understanding of the concept of hope and its function in people's daily life. Currently, researchers have reported the role of hope as a coping mechanism of terminally ill patients (e.g., cancer; Herth, 1989), as motivation to reach ones' healthy-eating goal (Winterich & Haws, 2011), as motivation to search for more information (De Mello, MacInnis, & Stewart, 2007), and as motivation to donate (Kappes, Sharma, & Oettingen, 2013). The results of the current prototype analysis may both confirm these functions and identify more functions that hope can play in the life of people.

Finally, research has revealed a number of positive influences that hope may have in many situations (e.g., Cavanaugh, Bettman, & Luce, 2015; Winterich & Haws, 2011). Hence, it would be advantageous if there was a way in which hope can be induced in people. Unfortunately, at present there is a limited understanding of how to operationalize hope, making it difficult how to exactly induce it (Cohen-Chen & Van Zomeren, 2018). Furthermore, a prototype analysis may also help in identifying the antecedent conditions, which gives important insights to our understanding on how to manipulate hope in research and how to induce hope to help people to cope with uncertainties in everyday life.

Overview of Studies

The current prototype analysis consists of five studies. In these studies, we follow the procedures that have been used by many other prototype studies (e.g., Gregg, Hart, Sedikides, & Kumashiro, 2008; Hassebrauck, 1997; Hepper et al., 2012; Seuntjens et al., 2015). In the remainder of this article we refer to these articles when we mention the "standard procedure". Study 1 is set up to identify the prototypical features of hope. Participants were asked to list characteristics they think to be important to describe hope. These characteristics were then categorized by independent coders, representing the features of hope. Study 2 examines the centrality of the features (i.e., how closely each of the features identified in Study 1 is related to hope) and categorizes them into central or peripheral features. Studies 3 and 4 examine whether central features are more accessible in memory than peripheral features, by using a recall task (Study 3) and a classification task (Study 4). Finally, Study 5 examines whether people rate central features as more representative in their life events involving hope than peripheral features, and whether hope features are rated as more representative for hope events than for ordinary events, testing the ecological validity of the features. All studies were preregistered and

the data sets are accessible on the Open Science Framework (https://osf.io/hsrwg/?view_only=af0e0179bc394bf090dfecaa7f6fb1f1).

Study 1

The goal of Study 1 is to provide a list of features of hope using a bottom-up approach. Participants were asked to list as many characteristics of hope as they could think of (up to a maximum of 25). Thereafter, the characteristics were grouped into higher-order categories, enabling us to construct a final list of features of hope. This study was preregistered via AsPredicted (Dutch dataset: #18504, http://aspredicted.org/blind.php?x=3pd9ws; American dataset: #19114, http://aspredicted.org/blind.php?x=ab7sw4).

Method

Participants. Our respondents were recruited from two sample populations: Dutch undergraduate students from a large Dutch university and U.S. citizens from Amazon Mechanical Turk (MTurk). One-hundred and 79 Dutch undergraduate students (127 males, M_{age} = 19.12, SD = 1.99; 100% Dutch native speakers) participated in exchange for course credit. This sample size was determined based on the largest sample size we had access to in school lab at that time. In addition, we aimed to collect 180 usable data points of U.S. citizens via MTurk and finally ended up with 202 participants[3,4] (100% English native speakers; 197 Americans, one Irish, one Porto Rican, one African American, one Israeli American, and one Venezuelan) who took part in our study in exchange for $0.60.

Although most prototype analyses used only one sample for feature generation (e.g., Fehr, 1988; Seuntjens et al., 2015), we decided to use a second participant pool (cf. Gregg et al., 2008). We did so because the two samples have different cultures and occupational backgrounds. Distilling laypeople's ideas of hope from both samples and selecting the overlapped part enables us to (a) facilitate future extrapolations to multiple populations; and (b) to "sieve" the nontypical categories of hope, namely, to eliminate the unrepresentative exemplars of hope.

Materials and procedure. Participants read the below instructions in their own language, after which they were given 5 min to list as many characteristics (up to a maximum of 25) as they could think of to describe hope:

> This questionnaire is part of a larger project on the thoughts that we have when we hear and use words. For example, if you were asked to describe democracy, you might write: freedom, elections, equality. If you were asked to describe a dominant person, you might write: orders others about, take charge, always wants to be right. In your view, which characteristics describe hope? Please write in the space below all features that distinguish hope. In the next 5 min, list as many features as you can think of. There are no right or wrong answers. You are not required to complete all boxes. After 5 min have passed, you will be able to continue to the final questions.

Results and Discussion

Following the standard procedure, we first coded the characteristics into higher-order exemplars and finally grouped the exemplars into a list of features. Two native Dutch-speaking research assistants classified the Dutch exemplars and two other coders with a high proficiency level of English coded the English exemplars.

The Dutch participants listed 870 specific characteristics in total (M = 12.28, SD = 5.49, per person), mostly single words. For sentences/phrases that contained only one related meaning, we treated them as single items; for sentences/phrases that contain more than one related meaning, we followed the procedure of other prototype studies (cf. Joffe & Yardley, 2004) and divided them into "units of meanings"—each of which referring to only one distinct characteristic of hope. Two Dutch coders followed the four-stage procedure of Hepper, Ritchie, Sedikides, and Wildschut (2012) to group the characteristics into higher-order exemplars which later grouped to a list of features: First, the words that were the same were grouped into characteristics, then the characteristics that were related semantically were grouped (e.g., "ambition" and "ambitious"), then the higher-order characteristics that were related in terms of meaning (e.g., "desire" and "yearn") were grouped into exemplars, and finally the exemplars that share a common meaning (e.g., "anticipation" and "expectation") were grouped and formed a list of features. Following the other prototype studies, features were excluded when they were: (a) semantically related to hope (e.g., "hope" and "to hope"[5]; however, "hopeless" was grouped together with other negative emotions such as "despair" under the more general feature "bad situations where you are in despair"); (b) mentioned three[6] times or fewer; (c) referred to a culture-specific concept. For instance, In Dutch, hope ("hoop") also holds a completely different secondary meaning, namely "a large amount of/a pile of." Therefore, the features related to this meaning were excluded. The two coders coded the initial characteristics into two lists of features. After that, they discussed together and combined the two lists into one; discrepancies were resolved by discussion and, in the cases where this was not sufficient, a third coder was involved. A fourth coder was involved to solve discrepancies for the very last few cases. This resulted in a list of 60 Dutch features.

The American MTurk participants listed in total 1,029 distinct characteristics (M = 12.02, SD = 7.03, per person), mostly single words. This dataset was coded using the same procedure as with the Dutch dataset. This resulted in the identification of 74 English

[3] We aimed at 180 participants as it is a comparable number to that in the Dutch dataset. Considering the rate of bots on MTurk, we oversampled to make sure we would obtain 180 usable data points. We ended up with 202 as total sample size.

[4] Gender and age were not registered due to a programming error.

[5] "Hopeful" and "hopefulness" were initially regarded as semantically-related words of hope and thus were excluded from further analysis. A helpful anonymous reviewer pointed out, however, that despite "hopeful" being semantically similar, it has a different meaning. Indeed, as "hopeful" is highly related to "optimistic," it should be grouped under the feature "positivity" instead. After checking our data again, we found that "hopeful" was mentioned one time in the Dutch dataset and two times in the MTurk dataset, whereas "hopefulness" was mentioned zero times in the Dutch dataset and four times in the MTurk dataset. After adding these counts to the target feature "positivity," the ranking of frequency in Table 1 did not change.

[6] Other prototype analyses removed items that were mentioned only once or twice. This current study has a much larger sample size, and thus items were mentioned more often. Hence, we decided to exclude items from further analysis when they mentioned three times or fewer.

features. There were no discrepancies between coders, so no additional coders were needed.

Among the two data sets, 52 features of hope were shared by Dutch and American participants; these features are hereafter called the features of hope. To assure that there were no differences across populations, we correlated the frequency of the 52 shared features that are mentioned in the Dutch and American data sets. We observed a strong correlation between the frequencies of the two data sets ($r = .69$, $p < .001$, 95% CI [0.51, 0.81]). Subsequently, following the protocol of other prototype studies that have different participant pools (e.g., Gregg et al., 2008; Seuntjens et al., 2015), we kept the 52 shared features and combined our Dutch and American data sets (see Table 2 for a list of the features and exemplars).

Table 2 shows that the feature "desire" was the most frequently mentioned feature (436 times), which is consistent with Bury, Wenzel, and Woodyatt's (2016, p. 588) definition of hope as something that "emerges when a desired goal has personal significance and the realization of that goal is possible (but not necessarily expected)". However, hope is more than just desire. Other important elements of hope are "positivity" and "future," which were mentioned 365 and 201 times, respectively (given 381 respondents). Positivity refers to perceptions of an optimistic attitude, looking at the bright side, and light at the end of the tunnel. Future refers to the forward-looking aspect of hope. These two features together identify the situations where hope is likely to emerge. This is consistent with Ai, Park, Huang, Rodgers, and Tice's (2007) definition of hope as "a form of positive general future expectancy." Another important element of hope is "faith," which was mentioned 225 times. Although "faith" was not mentioned so frequently by psychologists (see the definitions in Table 1), its exemplar "belief" was at least mentioned by some. For instance, Wenzel, Anvari, de Vel-Palumbo, and Bury (2017) regarded hope as "a positive anticipatory belief in the realization of particular outcomes" (cf. Miceli & Castelfranchi, 2010). Noticeably, although possibility was one of the most important elements identified by psychologists (see Table 1), it was mentioned only 71 times by participants.

Study 1 resulted in 52 cross-sample prototypical features of hope and found a strong positive correlation between the frequency of the features in the Dutch and American sample. This indicates a cross-culture consistency of people's opinions on these features. In the subsequent studies we recruited participants from various western countries (United Kingdom, Australia, the Netherlands), for further generalizability of the findings. At the same time, we realize that this is a trade-off against the coherence of the findings, and return to these decisions in the General Discussion section.

Study 2

Study 2 assesses the centrality of the features identified in Study 1, following the standard procedure. Centrality refers to how closely a feature is related to the concept of hope. This study was preregistered via AsPredicted (#20112, http://aspredicted.org/blind.php?x=z7wr8t).

Method

Four-hundred and 34 Dutch undergraduate students (85 males; $M_{age} = 20.06$, $SD = 2.18$) participated in exchange for course credit. The sample size was determined based on the largest sample size we had access to at that time and larger than all published prototype analyses. Participants were asked to rate how closely each of the 52 features derived from Study 1 was related to hope (1 = *not at all related*, 9 = *extremely related*). Therefore, they were shown each of the 52 features in random order. Each feature was displayed with three exemplars to ensure comprehension (e.g., the feature "improvements" was followed by its exemplars "improvement," "work out," "progress").

Results and Discussion

Mean ratings and standard deviations of the 52 hope features are listed in the two rightmost columns of Table 2. In the original dataset, participants' responses were listed in rows and each feature was listed in columns. Following the standard procedure, we first transposed the data, treating the 434 cases as variables in columns and the 52 features as cases in rows. Subsequently, we analyzed the reliability of the ratings of each feature among the 434 responses by using the intraclass correlation. The results showed that the ratings of participants were highly correlated for each of the 52 features (ICC = .99, $p < .001$, 95% CI [.985, .993]), indicating participants highly agreed on the centrality ratings. Subsequently, based on the mean ratings, we conducted a median split and labeled the highest 26 features as central to hope and the lowest 26 features as peripheral to hope. The difference in the centrality between some central features and peripheral features is small. Thus, readers should be aware that this median splitting does not lead to a strict categorization of central versus peripheral features. Yet, the more central a feature is, the closer and more important it is to hope.

In accordance with the results of Study 1 and Wenzel et al.'s (2017) definition of hope, a central aspect of hope involves faith (exemplified by belief). Moreover, desire, positivity, and future are also perceived as central features of hope, consistent with the results of Study 1 and previous research (Ai, Park, Huang, Rodgers, & Tice, 2007; Bury et al., 2016). Despite possibility not being mentioned frequently in Study 1, it was rated as one of the most central features of hope in Study 2, which is consistent with previous research (e.g., Kavussanu et al., 2014; Nelissen, 2017; Whitson et al., 2015). We also add to the literature some new insights. For instance, although "uncertainty" is regarded a keyword to define hope by some psychologists (see Table 1: e.g., Halevy, 2017; Leshem, Klar, & Flores, 2016), it was considered a peripheral feature by participants. Moreover, although "belief/faith" was rated as the most important feature of hope, it was not used very often by previous researchers to define hope (see Table 1: e.g., Elliott, Witty, Herrick, & Hoffman, 1991; Cohen-Chen, Crisp, & Halperin, 2015). We will further discuss the similarities and differences between our findings and previous research in the General Discussion section.

To summarize, we identified 52 features of hope based on laypeople's view of characteristics of hope (Study 1) and the centrality ratings of the identified features (Study 2). As a result, the list of 52 features cover most of the key components of hope mentioned in previous literature, provides information about their relative importance, and enriches our understanding of possible origins of hope. In the following studies, we examine the validity

Table 2
Features of Hope, Exemplars, Frequencies in Study 1, and Centrality Ratings (1 = Not at All Related, 9 = Extremely Related) in Study 2, Ordered by Mean Centrality Ratings in Study 2

Feature	Exemplars provided by participants			Study 1 (N = 381)	Study 2 (N = 434)	
				Frequency	M	SD
			Central			
Faith	faith	belief	believe	225	8.05	1.273
Positivity	optimism	positive	bright side	365	7.62	1.386
Future	future	prospect	look forward	201	7.62	1.376
Bad situations where you are in despair[a]	fear	tension	sadness	168	7.44	1.782
Possibility	chance	possibility	lottery	71	7.14	1.623
Goals and plans	goal	plan	ambition	183	7.13	1.581
Motivation	motivation	motivated	mentality	33	6.99	1.617
Peace	peace	war	white dove	57	6.91	1.755
Desire	desire	want	longing	436	6.89	1.786
Trust	trust	reliance	have confidence in	85	6.84	1.681
Love	love	loving	feeling sense of love	75	6.83	1.829
Imagination	dream	imagination	unrealistic	163	6.82	1.76
Expectation	expectation	anticipation	expecting	152	6.82	1.734
Feelings	feelings	good feelings	emotion	110	6.71	1.635
Happiness	happiness	joy	cheerful	112	6.65	1.774
Freedom	freedom	liberty	free	37	6.64	1.86
Loved ones	family	friends	parents	60	6.56	1.818
Religious	prayer	god	religion	98	6.55	2.395
Determined	determination	perseverance	holding on	109	6.5	1.894
Achievements	achievements	success	win	52	6.48	1.809
Encourage	encourage	urge	encouragement	12	6.44	1.737
Thoughts	thoughts	thinking	consideration	83	6.38	1.766
Human	human	people	humanity	26	6.36	2.028
Cope with bad situations[b]	cope	never despair	last resort	24	6.28	1.971
Improvements	improvement	work out	progress	73	6.27	1.849
Strength	strength	power	strong	40	6.26	2.046
			Peripheral			
Commitment	commitment	promise	devotion	37	6.13	1.837
Change	innovation	change	start	41	6.09	1.973
Good	good	best	nice	76	6.05	1.854
Health	health	healthy	wellness	16	6.05	1.964
Being alive	breath	life	living	37	6.01	2.037
Excited	excited	enthusiasm	passion	21	5.86	1.825
Effortful	hard work	effort	striving forward	27	5.84	1.972
Outcome	outcome	gains	reward	47	5.81	1.84
Helpful	help	support	assistance	31	5.81	1.918
Meaningful	meaningful	important	makes sense	18	5.79	1.987
Waiting	wait	waiting	patience	50	5.73	2.134
Self-confidence	confident	pride	self-confidence	45	5.68	1.982
Fairness	justice	fairness	equality	21	5.55	1.931
Truthful	truth	honest	sincere	14	5.5	1.961
Uncertainty	uncertainty	doubt	unsure	67	5.47	2.225
Job and career	work	job	career	29	5.3	2.071
Unity	union	solidarity	collective	27	5.3	2.014
Needs	necessary	needs	everyone needs it	16	5.23	2.017
Education	education	school	college	20	5.14	2.247
Naïve	naïve	innocence	child	29	4.91	2.179
Calm	calm	cool	relief	34	4.77	2.016
Assumption	assuming	assumption	to assume	7	4.71	1.968
Knowledge	knowledge	know	learning	8	4.65	2.163
Active	energetic	active	action	14	4.58	2.039
Finance	stock	money	welfare	37	4.48	2.142
Beauty	beauty	handsome	beautiful	18	4.04	2.005

[a] This feature was originally named "Bad situations where hope is needed" in Study 2, but the name of the feature was adapted thereafter for subsequent studies to remove the influence coming from the word "hope" itself. [b] The key characteristic of this feature is "coping" which is quite different to the descriptive nature of the feature "bad situations where you are in despair."

of the classification of features into central versus peripheral by examining the impact of these two types of features on people's information processing.

Study 3

Study 3 uses a recall paradigm to test the validity of the classification of features as central versus peripheral. Following the logic of the other prototype analyses that central features are more readily recoded in people's memory than peripheral features, we predict that recall and recognition of central features is easier (i.e., faster) than of peripheral features. Furthermore, as a feature's centrality is uniformly related to its accessibility, we predict that central features that were not asked to be memorized, resulted in a higher rate of false recall and false recognition than peripheral features. This study was preregistered via AsPredicted as #21146, http://aspredicted.org/blind.php?x=ei22uj.

Method

Participants. We preregistered to recruit 100 Dutch students, to have a sample size that was comparable to the other prototype analyses (102 in Seuntjens et al., 2015; 99 in Hepper et al., 2012). Unfortunately, only 30 Dutch undergraduate students (18 males; M_{age} = 19.63, SD = 1.07) signed up for the study. Hence, we recruited an additional 92 United Kingdom citizens (37 males; M_{age} = 36.24, SD = 14.17) via Prolific, including a 20% buffer for potential drop-outs. The Dutch students participated in exchange for course credit and the United Kingdom citizens participated in a series of unrelated studies in exchange for £1.20.

Materials and procedure. The 52 features identified in Study 1 and 2 were divided into two sets of 26 features, each consisting of 13 central and 13 peripheral features (randomly selected). Correlation tests showed that the centrality ratings of the features in Set 1 ($M_{central}$ = 6.77, SD = 0.49; $M_{peripheral}$ = 5.41, SD = 0.63) did not differ from those in Set 2 ($M_{central}$ = 6.86, SD = 0.41; $M_{peripheral}$ = 5.40, SD = 0.51; $p_{Central}$ = .66, $p_{Peripheral}$ = .96; see the two sets in Appendix A). Following the standard procedure of prototype analyses, we asked participants to review 26 sentences that state "Hope is associated with: Feature," in which the feature was highlighted (e.g., Hope is associated with: Uncertainty).

Participants were randomly assigned to one of the two sets of features. They were told that they would view 26 statements of hope (in a speed of 4 s per statement) and that they would be asked to recall them later. After viewing all the statements, participants were asked to complete an unrelated task (i.e., distraction task) for 5 min. Subsequently, they were given 3 min to recall as many features of hope they saw in the earlier task as they could. Finally, to assess participants' recognition, they were presented with a full list of the 52 features of hope and were asked to categorize them into "features I did see before" and "features I did not see before."

Dependent measures. Four independent variables were measured: the numbers of correct recall, false recall, correct recognition, and false recognition. For the recall task, correct recall occurred when participants recalled a feature from the assigned set, false recall occurred when they recalled a feature from the other set; if participants recall a word that does not belong to any of the two sets, it was considered neither a correct nor a false recall. For the recognition task, correct recognition occurred when participants categorized a feature from the assigned set as "did see before" or a feature from the other set as "did not see before"; otherwise, it was considered a false recognition.

Results and Discussion

Two participants were excluded from the data analysis because they failed to follow instructions (one wrote in a different language and one wrote for all 26 recalls "Memory like a sieve"), leaving us 120 usable data points. Results are the same across sample pools. We measured and compared four dependent variables between central and peripheral features. The average numbers of the four dependent variables mentioned are shown in Table 3.

To examine whether people indeed correctly and falsely recall and recognize more central features than peripheral ones, we conducted four Wilcoxon signed-ranks test.[7] The results showed that, as expected, participants recalled significantly more central features (M = 3.67, SD = 2.61) than peripheral features (M = 2.84, SD = 2.30; Wilcoxon's $Z(119) = -3.88$, $p < .001$, $r = -.25$; see Table 3), that they falsely recalled significantly more central features (M = 0.29, SD = 0.61) than peripheral features (M = 0.06, SD = 0.24; Wilcoxon's $Z(119) = -3.64$, $p < .001$, $r = -.23$), that they correctly recognized significantly more central features (M = 9.39, SD = 1.90) than peripheral features (M = 8.80, SD = 1.90; Wilcoxon's $Z(119) = -2.74$, $p = .006$, $r = -.16$), and that they falsely recognized significantly more central features (M = 4.83, SD = 1.92) than peripheral features (M = 2.92, SD = 1.71; Wilcoxon's $Z(119) = -7.49$, $p < .001$, $r = -.48$).

As predicted, the results of Study 3 demonstrate that the central features of hope are indeed more accessible in memory than the peripheral ones. Specifically, participants did not only correctly recall and recognize more central features than peripheral ones, but are also more likely to falsely remember that they had seen central features than peripheral features they did not see before. Therefore, these results provide strong evidence for our classification of central and peripheral features. An alternative explanation emerges that, regardless of activation of the concept of hope, the central features might in general be more accessible in people's memory than peripheral ones. We explored this alternative account in Study 5.

Study 4

Study 4 further examines the validity of our classification by examining whether it is easier for people to judge a central feature (vs. a peripheral feature) as a feature of hope. Given the assumption that central features are more accessible in people's memory, we hypothesize (a) that people are more likely to judge central features (vs. peripheral ones) as a feature of hope and (b) that people will spend less time to categorize a central feature (vs. a peripheral one) as a feature of hope. This study was preregistered via AsPredicted as #21447, http://aspredicted.org/blind.php?x=xz7mk6.

[7] We opted for this nonparametric test because the data were not normally distributed.

Table 3
Mean Number of Recalled and Recognized Central and Peripheral Features (Both Correct and False) in Study 3

Dependent measures	Central		Peripheral		Central Versus Peripheral	
	M	*SD*	*M*	*SD*	Wilcoxon's *Z*	*p*
Correct recall	3.67	2.61	2.84	2.31	−3.88	<.001
False recall	0.29	0.61	0.06	0.24	−3.64	<.001
Correct recognition	9.39	1.9	8.8	1.895	−2.47	=.006
False recognition	4.83	1.92	2.93	1.72	−7.49	<.001

Method

Participants and design. We preregistered to obtain at least 150 responses in the behavioral lab of the University of Melbourne business school, resulting in a sample size comparable to other prototype analyses. We finally ended up with a sample size as large we had access to in the lab at that time. One-hundred and 89 Australian undergraduate students (70 males; M_{age} = 19.19, *SD* = 1.23) were assigned to a three-group (feature types: central vs. peripheral vs. control) within-subject design in exchange for course credit.

Materials and procedure. Participants viewed 114 words: 26 central features, 26 peripheral features, and 62 unrelated neutral words (10 were used in trial rounds before starting; the other 52 served as our control condition). The set of neutral words was constructed by selecting 62 most frequently mentioned nouns that did not appear in our dataset and were not related to hope[8] (see the list of neutral words in Appendix B) from a list of the 5,000 most frequently used English words (downloaded from Word Frequency Data, 2019). People first viewed 10 neutral words to practice the procedure. After that, they viewed the remaining 104 words (52 remained neutral words and 52 hope feature words) one by one in random order. Participants were asked to judge as quickly and accurately as possible whether each of the total 104 words was a feature of hope ("yes" or "no"). The number of yes responses and participants response latency (in *ms*) were recorded.

Results and Discussion

To test our hypotheses, we first compared the percentage of words judged as a feature of hope across three groups of stimuli. Subsequently, because we were only interested in how fast a feature was categorized as a hope feature, we compared the average latency of yes responses across the three conditions. We recoded extremely slow latencies (>3,000 ms) to 3,000 and extremely fast latencies (<300 ms) to 300, and logarithmically transformed the latencies to correct for skewness (cf. Greenwald, Nosek, & Banaji, 2003, and as applied in other prototype analyses). The average rates and latencies are shown in Table 4.

We compared the percentages first. A Friedman-test (basically a nonparametric ANOVA that we use because of the skewness of the data) found a significant main effect of feature centrality on the rate of features classified as hope features, Friedman $\chi^2(2, 189) = 328.14$, $p < .001$, Kendall's $W = .87$. Nonparametric Wilcoxon's tests were conducted for simple comparisons. Central features were more likely to be classified as a feature of hope than peripheral features, $Z(188) = -10.78$, $p < .001$, $r = -.56$, and that peripheral features were more likely to be classified as a feature of hope than the neutral words, $Z(188) = -11.82$, $p < .001$, $r = -.61$.

We then compared the classification speed for yes responses using the log-transformed latency. An ANOVA revealed a significant main effect of feature type on classification speed, $F(1.52, 262.91) = 54.26$, $p < .001$, $\eta_p^2 = .24$. Specifically, participants spent less time classifying central features ($M = 3.35$, $SD = 0.05$) than peripheral features ($M = 3.36$, $SD = 0.06$), $F(1, 173)$[9] = 9.67, $p = .002$, $\eta_p^2 = .05$, 95% CI[10] [−0.01, −0.002]. In addition, they spent less time classifying peripheral features than neutral words ($M = 3.38$, $SD = 0.06$), $F(1, 173) = 54.26$, $p < .001$, $\eta_p^2 = .21$, 95% CI [−0.03, −0.02].

This study reveals that participants categorized central (as compared with peripheral) features more often to hope and they spend less time classifying central as compared to peripheral features. Furthermore, it shows that participants categorize peripheral features more often to hope than control features and they spent less time categorizing peripheral than control features.

Study 5

Study 5 investigates the ecological validity of the hope prototype in a real-life setting by adopting a procedure that has been previously used in a prototype analysis of greed (Seuntjens et al., 2015). Participants were asked to recall either "a situation in which you experience a strong feeling of hope" (hope condition) or "an ordinary situation experienced during an ordinary week day" (control condition). They were then asked to indicate to what extent each of the 52 features of hope appeared in the described event by answering the question "to what extent did you feel the following during the situation you just described" (1 = *not at all*, 8 = *very much*). Each of the features were embedded in statements such as "I had goals and plans in my mind in this situation" and "I experienced peace in this situation."

Assuming that central features are more accessible than peripheral features (as was the case in Studies 3 and 4), we predicted (a) that hope features would be mentioned more often by people who recalled a hope situation than for those who recalled an ordinary event and (b) that for those who recalled a situation of hope, central features would appear more frequently in the situation and would thus be more representative, than peripheral features. This study was preregistered via AsPredicted as #23240, http://aspredicted.org/blind.php?x=fy2s68.

Method

Participants and design. One-hundred and nine United Kingdom citizens (32 males; M_{age} = 37.37, *SD* = 13.59), recruited via Prolific in exchange for 0.8£, were randomly allocated to a 2 (recalled situation: hope vs. control) × 2 (features: central vs.

[8] We made sure none of the neutral words used in this study appeared as an exemplar in the English dataset of Study 1.

[9] Because 15 people classified all 52 control features as not a feature of hope, there are 15 missing values in their log-transformed timing for yes-responses, resulting a 162 df's for subsequent analyses.

[10] This is the CI of the difference between the means across two groups. The same applies to the other CIs in this study.

Table 4
Percentages of Words Classified as Hope Features and Classification Speed in Study 4

Dependent measures	Central		Peripheral		Control	
	M	*SD*	*M*	*SD*	*M*	*SD*
Percentage categorized as hope (%)	87.45	13.20	74.44	19.52	32.14	28.41
Response speed of "yes" (ms)	2326.30	275.53	2355.90	277.50	2497.26	311.91
Response speed of "yes" (log)	3.356	0.056	3.361	0.056	3.387	0.061

peripheral) mixed design, with the first factor being the between-subjects variable and the second the within-subject variable. We based our sample on similar studies in published prototype analyses that typically show large effect sizes (e.g., Elshout et al., 2015; Hepper et al., 2012; Seuntjens et al., 2015).

Materials and procedure. Participants recalled and wrote down either a situation in which they felt hope or an ordinary situation. After describing the situation, the 52 features of hope were in random order presented on separate screens. Participants were asked to indicate to what extent each of the features was present in the situation they just described (1 = *not at all*, 8 = *very much*).

Results and Discussion

Before hypothesis testing, we first computed the average score of central ($M = 5.03$, $SD = 1.03$) and peripheral ($M = 4.69$, $SD = 1.01$) features for each response (cf. Hepper et al., 2012; Seuntjens et al., 2015). To test the hypothesis, we conducted a 2 (recalled situation: hope vs. control) × 2 (features: central vs. peripheral) mixed measures ANOVA. The results showed only the predicted main effect of recalled situation, $F(1, 107) = 25.16$, $p < .001$, $\eta_p^2 = .19$, hope features generally represented the hope experience better ($M = 5.27$, $SD = 0.75$) than the ordinary event ($M = 4.41$, $SD = 1.02$). This result confirms our first prediction that activation of hope makes central features more accessible. To test the second prediction, simple effect tests were conducted. The results showed that for people within the hope condition, central features ($M = 5.48$, $SD = 0.74$) were more present than peripheral features ($M = 5.06$, $SD = 0.84$), $F(1, 107) = 36.34$, $p < .001$, $\eta_p^2 = .25$, see Figure 2.

In addition to the preregistered analyses, we also explored whether central features are more readily coded than peripheral features in people's memory regardless of the activation of hope (something that came up in the discussion of Study 3). Whereas we observed that for participants in the control condition (those who recalled an ordinary event) central features were more present ($M = 4.55$, $SD = 1.08$) than peripheral ones ($M = 4.28$, $SD =$

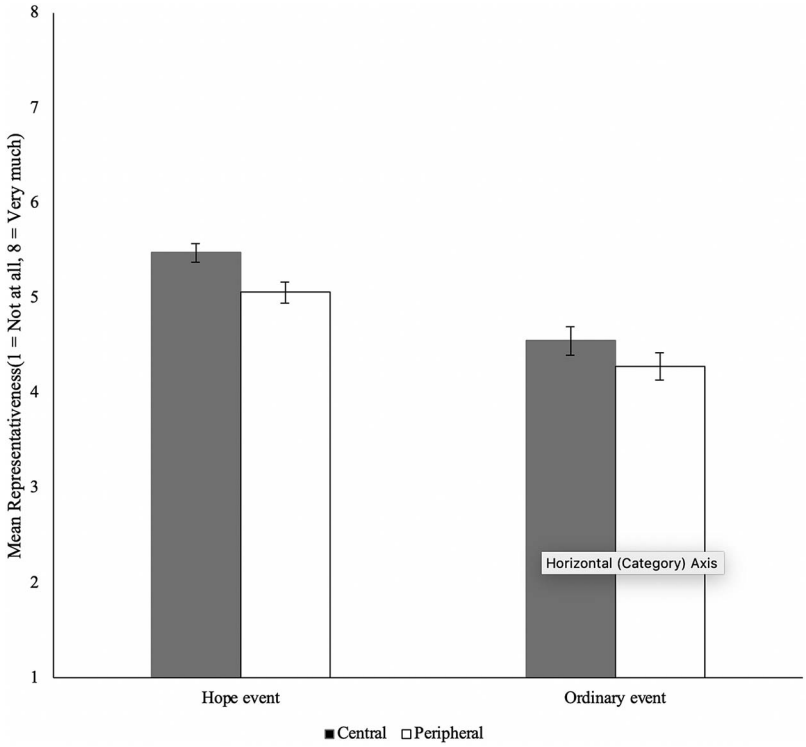

Figure 2. Participants ratings of the extent to which central and peripheral features were present in the event they recalled (Study 5; error bars refer to standard errors).

1.03), $F(1, 107) = 13.75$, $p < .001$, $\eta_p^2 = .11$, the effect size of this difference is less than half the size of that in the hope condition. However, as mentioned in the results earlier, the interaction in the ANOVA was not significant, $F(1, 107) = 2.20$, $p = .14$, $\eta_p^2 = .02$. Therefore, whereas our findings are providing tentative evidence, more research is clearly needed.

To sum up, Study 5 confirmed our preregistered hypotheses that hope features appear more often in situations about hope than in neutral situations and that central features appear more often than peripheral features when describing hope events, and are thus more representative of hope. Therefore, Studies 3–5 clearly validate the classification of both central and peripheral features as being indicative of hope.

General Discussion

We conducted a prototype analysis of hope to understand what hope is, what it does, and how it is used in everyday language. We believe that this is important, because despite hope being studied since a long time and it considered to be a very important construct, there appears to be little consensus on its definition (Bruininks & Malle, 2005; McGeer, 2008). In order to address this concern, we conducted a prototype analysis as this is a fully data-driven bottom-up approach. As such, a definition of hope can be identified, free from any preexisting theories or opinions. In Studies 1 and 2, we distinguished 52 features of hope from the responses of laypeople and assessed the centrality of each of these features. In three subsequent studies, we established the validation of this classification and found that central, as compared with peripheral, features were more likely to be recalled/recognized from memory (Study 3), more likely to be judged as features of hope (Study 4), and appeared more frequently in situations where people feel hope (Study 5). Together, these studies provide insight into what hope is and what hope does.

Toward a Working Definition of Hope

Based on these findings, we propose a working definition of hope. We compare the features identified in the prototype analysis to those that have been identified in previous theoretical and empirical research. Below we will make such comparisons, and provide our understanding of the core elements of hope. We also discuss our findings in relation to the position on hope taken by Snyder et al. (1991) and by Averill et al. (1990). We further address the implications of our findings, discuss the limitations, and how they feed into potential avenues for future research.

Core features. First, "desire" (exemplars: "desire," "want," "longing") is one of the most important central features of hope, as it is consistently identified as such in both the academic literature (see Table 1) and in our studies. In our results, "desire" was mentioned most frequently (436 times, almost 100 times more than the second most mentioned feature). Participants indicated they experience "longing" and "desiring" for things when feeling hope. However, although "desire" is a non-negligible part of hope, it is not hope per se. Previous research found that "desire" is elicited when the situations are judged as "favorable for realizing the outcome" while *hope* is also elicited when the situations are difficult but the hoped-for outcome is still attainable (see the review of Bruininks & Malle, 2005 and Roseman, Spindel, & Jose, 1990). This suggests that beyond mere *desire*, the possibility of attaining the outcome constitutes another important part of hope. That is also the second most important feature, as we discuss below.

In addition, "possibility" (exemplars: "chance," "possibility," "lottery") is shown to be another important central feature of hope in our prototype analyses, and this finding helps to solve an issue in the existing literature. As is apparent in Table 1, some definitions in the academic literature mention "possibility" as an important aspect of hope (e.g., Kavussanu et al., 2014), yet some others do not consider it at all (e.g., Elliott et al., 1991). Moreover, although some mention "possibility" as a key element of hope, the literature reveals different opinions as to whether "possibility" refers to a realistic possibility (Amsler, 2008; Haase, Britt, Coward, Leidy, & Penn, 1992) or to just a wish (e.g., Leshem et al., 2016). This shows that "possibility" is important to define hope, as it differentiates "hope" from mere "desire," in that people can desire anything but will only hope for possible things. Moreover, "possibility" differentiates "hope" from an unrealistic "wish" as well. As such, in difficult situations, when people are in despair, they need hope as it provides a possibility (even when unlikely) to get out of their current situation.

Furthermore, "bad situations where you are in despair," "coping with bad situations," and "positivity" are three important features of hope. Consistent with previous research, our results identify hope as something positive helping people to cope with negative situations. In our results, participants associated hope with "positive thinking," "silver lining," "bright sight of the situation," and "light at end of the tunnel." In previous research, Ai et al. (2007) described hope as "a positive general future expectancy." Cohen-Chen, Crisp, and Halperin (2017) defined hope as "a positive emotion" generated by a "desired future," indicating hope is specifically about a positive and forward-looking outcome. Echoing previous research, our results indeed suggest "future" (exemplars: "future," "prospect," "look forward") as a central feature of hope.

Lastly, "faith" (exemplars: "faith," "belief," "believe") is shown as a central feature of hope in our prototype analysis.[11] Previous literature, except for some (e.g., Snyder et al., 1991; Wenzel et al., 2017), typically does not mention "faith" (or "belief") when defining hope. Our results suggest however that both faith and belief may be more important than previously considered. Indeed, some other researchers argue that "hope" per se is a "belief," especially a "belief" about "uncertain" things (Clarke, 2003; McGeer, 2008).

A working definition of hope. Taken together, on the basis of the results of our prototype analysis, and a comparison of these results with the academic literature, we define hope as a *belief that a positive future outcome is possible* combined with *a desire for that outcome*. We believe this definition has many merits: (a) it captures the most prototypical and central features of hope based on the rated importance (i.e., centrality) by laypeople; and (b) it unifies the many different definitions of hope. More specifically, our definition refers to "thoughts involving possibility," which implies a cognitive process and the "desire for the possibility,"

[11] To clarify, although faith is, according to the dictionary definition, associated with religions and confidence (see OED, 2019), in current research, it was listed by participants as a separate characteristic and coded as a separate feature (separate from features religious and self-confidence) to describe hope.

which implies an emotional process, indicating that hope is indeed a mixture of both. Moreover, in line with previous research suggesting that the emotion of hope could motivate people to pursue a positive outcome (see a review of Bruininks & Howington, 2019), our findings further suggest that it might be the desire, as the core part of the emotional dimension of hope, that induces goal-congruent motivation and behaviors.

Unlike most of the definitions of hope in Table 1, we chose not to explicitly define hope as a pure emotion or a pure cognition. Hope is undoubtedly an emotion that is infused with cognition; it cannot exist without thoughts about the current bad situation and the desired future outcome. However, we decided not to make this distinction explicit in our definition because our prototype analysis did not indicate those as the most central features. Put differently, whether hope is predominantly emotional or cognitive is not one of the most important things people think about when they think about hope.

Overlap and Discrepancies

In addition to providing a working definition of hope, the current research also identifies some overlap between our findings and some of the most important previous theories of hope, as well as some discrepancies. In the following, we discuss (a) the similarities and differences regarding the definitions of hope (we focus on two mainstream definitions of Snyder et al., 1991 and Averill et al., 1990, according to the review of Bruininks & Malle, 2005); and (b) the similarities and differences regarding some important constructs related to hope.

Snyder et al.'s (1991) definition of hope. These authors define hope as "(a) agency (goal-directed determinations) and (b) pathways (planning of ways to meet goals)," (p. 570), and many other researchers followed this definition (see Table 1, e.g., Ai et al., 2007; Curry, Snyder, Cook, Ruby, & Rehm, 1997; Davis & Hicks, 2013; Elliott et al., 1991). This definition focuses on goal-related features of hope and also emphasizes individuals' ability (Snyder et al., 1991, see Table 1). By comparing our findings with this definition, we found the following overlap and discrepancies.

On the one hand, our findings suggest that indeed, "goals and plans"[12] and "motivation"[13] are among the most important features of hope, echoing with the "pathway" component of Snyder et al.'s (1991) definition of hope. On the other hand, however, the "agency" component (e.g., individual "determination" and "ability") was not considered as one of the most important features of hope by lay people according to our findings. Specifically, "determined" was ranked only 19th among the 26 central features and "ability" was not listed as a hope feature. Moreover, our findings suggest features including "faith/belief,"[14] "bad situations where you are in despair,"[15] "desire"[16] to be important features of hope yet were overlooked in Snyder's definition of hope.

Averill et al.'s (1990) definition of hope. These authors' definition of hope goes beyond the abovementioned goal-directed framework and define hope using four "rules": (a) hoped-for events should be realistic/attainable; (b) they should be socially acceptable; (c) they should be important; (d) given it is possible, people should act on their hoped-for events. Our findings resonate with Averill et al.'s (1990) research in several aspects, but also differs from it in other respects, as we explain below.

The findings of our prototype analysis suggest that indeed, "possibility" is important for people to experience hope; people's "motivation" and "goals and plans" are associated with hope, indicating that they might take actions for what they hoped for. These findings are in line with the first and fourth rule of hope mentioned above. However, the importance of the hoped-for event was found to be only a peripheral feature (i.e., "meaningful") of hope. Lastly, our findings did not indicate any thoughts of "acceptability" to be important for hope.

Further, whereas Averill et al. (1990) define hope as an emotion, they did not describe what exact emotion composes the feelings of hope. This might be due to the fact that they asked participants to describe their experience of hope by distinguishing it from the experience of desire and wanting. They thus started with the assumption that desire is not a core element of hope, which is contrary to our findings (see above section). More importantly, we propose that the desire for a positive future outcome is the most important emotional component of hope because it is one of the core elements that came out of our prototype analysis and in line with what was suggested by other researchers (see Table 1, e.g., Bury et al., 2016; Cohen-Chen et al., 2017). What's more, the definition of Averill et al. (1990) did not include "bad situations where you are in despair" and "faith/belief" which are considered important features of hope by lay people.

How hope is related to other constructs. The prototype analysis identified a number of features that were considered as central or peripheral. Please note that these stem from asking lay people to list as many features as they could think of that distinguish hope. Experiences of hope are of course often accompanied by other, closely related experiences, and it makes sense that these also come to mind easily when people are requested to write down features of hope. As a result, some central features of hope can be seen more as concomitants of hope, than as core elements of hope itself (cf. Seuntjens et al., 2015). Of course, the decision of which feature is a core element and which is a concomitant, is a subjective one, and typically made top-down (thus losing some of the advantageous of a data-driven prototype analysis). We believe that features such as "optimism" and "love" are such concomitants. We address below the important distinctions between optimism and hope and between love and hope, to prevent potential confusion in understanding hope.

Optimism (regarded as a "positive attitude" in Bennett, 2011; Scheier & Carver, 1992) is sometimes considered the same as hope (e.g., Maier, Peterson, & Schwartz, 2000; Peterson & Seligman, 2001). Other research distinguishes between optimism and hope by taking the probability of an event into account: individuals are "optimistic" about a prospect when it is highly likely to be true, whereas they "hope" for things which are not likely but still possible to be true (Bruininks & Malle, 2005; see empirical results

[12] "Goals and plans" was rated as the sixth most important feature of hope among the 26 central features.

[13] "Motivation" was rated as the seventh most important feature of hope among the 26 central features.

[14] "Faith" exemplified by "belief" was rated as first, namely the most important feature of hope.

[15] "Bad situations where you are in despair" was rated as the fourth most important feature of hope.

[16] "Desire" was rated as the ninth most important feature of hope.

in Bury, Wenzel, & Woodyatt, 2018). In other words, optimism is about probability while hope is about possibility. Our findings add to the distinction of the two constructs by identifying the limited overlap between hope's other central features and optimism. Specifically, our results show that "desire" is an important feature of hope while it does not characterize "optimism." "Desire" is associated with other most important features such as "goals and plans" and "motivation," because "desire" as an emotion can motivate people's behavior (Averill et al., 1990) and it makes sense that people work hard for what they desire for. "Optimism," however, is an attitude or a positive perspective of looking at life, which may not bring the motivation and thus behavior to reach a specific outcome. For instance, a student might work hard for GRE tests if he or she hopes to receive a good grade but might not when feeling optimistic that he or she will receive a good grade. As such, whereas our findings indicate that optimism is an important feature of hope, they also show that this positivity does not overlap much with other important features of hope (e.g., desire, goals and plans, motivation). Thus, we conclude that although hope has some overlap with optimism, it should be treated as a different construct.

Love was also identified as a central feature of hope, and we believe that love also qualifies as a concomitant instead of a core element of hope. For love this is less complex. Love is different from hope, as a person can feel love without feeling hope. And, the reverse is also true, one can feel hope without feeling love (e.g., hope for winning a lottery ticket). Thus, although love and optimism came out of the prototype analysis as being closely related to hope, we see them as concomitants rather than as core elements of the hope experience.

Implications

A prototype analysis identifies associations between the target concept and other constructs. However, as we described above, a prototype analysis cannot determine whether the associated feature is a core element or a concomitant. The same difficulties apply when we want to qualify the associated features as antecedents or consequences of the studied concept. The analysis by itself cannot do this. We can, however, propose some associations that are worth noting for future empirical research. Again, these propositions are made top-down, based on our opinions about the current findings and how they relate to previous theorizing. The current findings have implications for understanding the role of hope in everyday life. Although previous research has discussed much about the antecedents of hope, limited research has been done to understand what the function of hope is. The findings reveal how hope may work as a coping mechanism. They also reveal how hope is related to current goals and motivations, and to change for the better.

Functions of hope. We believe that in everyday life, hope is functional in two important and related ways. First, hope helps people to cope with negative situations, and as such may motivate people to keep going or undertake action. Desperate people often need hope to continue their daily life (Cutcliffe, 1998; Cutcliffe & Barker, 2002). Even when a positive outcome is highly unlikely, the mere possibility of reaching such outcome should be highlighted in order to cope better with the situation. At least in line with this perspective, empirical evidence from clinical research shows that hope can help bereaved women (Holtslander & Duggleby, 2009), substance-abuse addicts (Koehn & Cutcliffe, 2012), depressed individuals (e.g., Gordon et al., 1989), suicidal people (e.g., Walsh & Minor-Schork, 1997), and schizophrenia patients (e.g., Kirkpatrick et al., 1995) to improve their situation. The central features "bad situations where you are in despair" and "cope with bad situations" from the current prototype analysis are clearly consistent with this coping function of hope. This coping function has been largely studied in clinical domain, but more research is needed to understand how this coping function of hope influences people's daily life.

Second, besides coping with negative situations, hope motivates people to pursue positive outcomes in other less high-stake situations. As suggested by both our results and previous literature (Snyder et al., 1997), hope is important in goal-oriented situations (central feature: goals and plans). As such, in general goal-setting, hope can motivate people to pursue their desired outcome. For instance, if a person strongly hopes for a fitter body, one might make strict diet plans and exercise more regularly. Indeed, previous research found that inducing hope helps consumers to consume less unhealthy food (Winterich & Haws, 2011). This is consistent with the "desire" element in hope (for a positive outcome) that motivates people to engage in thoughts about "goals and plans" which may eventually lead to actions. For instance, highlighting people's imagination of a better-self might motivate people to take actions because it heightens their desire for it.

Antecedents of hope. Previous research suggests many antecedents of hope (e.g., "pathway," Snyder et al., 1991; perceived human family support, education, etc., Obayuwana & Carter, 1982), so our discussion in this section will focus on other potentially overlooked antecedents that were empirically important. Other than our core elements, we do believe there are other potential antecedents of hope that researchers can use to manipulate hope. For instance, a such potential antecedent of hope is reflected in the feature "change" (exemplified by "innovation," "change," and "start"). Specifically, where there are changes, there are chances. Change brings new things, new opportunities, and more possibilities. As a result, the new possibilities enable individuals to look into the future and motivate them to strive for the desired positive outcome. Therefore, introducing changes or providing new opportunities to people might help them to restore their desire for reaching the possible positive future. This resonates with Averill et al.'s (1990) finding that hope can be initiated by changes in hoped-for events. At least some empirical research successfully induced hope by manipulating perceptions of a "changing world" (Cohen-Chen, Halperin, Crisp, & Gross, 2014).

Limitations and Future Research

We think that this set of studies provides compelling insights into what people talk about when they talk about hope. We are however aware of the limitations of these studies and how these create room for further research. One of the limitations is the usage of different samples across studies. We think that because we focused on the more basic elements of emotion, and because we recruited participants from several western countries, these differences seem limited. One may argue, however, that it would have been better to sample participants from the same population throughout the whole analysis, because the findings would have been more coherent, and perhaps in a next phase replicate the

results in other populations. At the same time, we also think that having participants from the U.S., the Netherlands, the United Kingdom, and Australia is a strong point of our research. Given the correspondence of the findings in Study 1, and the replication of the distinction between central and peripheral features in Studies 2–5, having different populations adds to the generalizability of our findings. As such, our findings speak toward our generic characterization of hope. Future research may investigate potential differences in centrality of features between different and more diverse cultures and finetune the definition of hope for these specific cultures.

A second limitation of the current analysis is that we were not able to rule out that the features that we found to be central to hope are generally more accessible than the peripheral features. This general difference in accessibility was an alternative explanation for the findings reported in Study 3 (that is, also when hope is not involved). Our findings in Study 5 clearly show that central features are more often mentioned than peripheral ones when people think about situations in which they experienced hope and that this difference is attenuated when thinking about in ordinary situations. Our exploratory analyses could not, however, rule out that central features are always more accessible and experienced than peripheral features. We suggest that our study could not provide conclusive evidence as it seems that hope is omnipresent in people's daily life and routines (e.g., we hope that the weather will be sunny tomorrow, not to get in a terrible traffic jam, etc.).

In summary, in this research, we adopted a completely bottom-up approach, and used laypeople's conceptualizations to derive a prototype of hope. The result of this analysis is the identification of a set of features that are central to the concept of hope and that may be instrumental in explaining when and why people feel hope. This provides insights into how feelings of hope impact people's goal striving and how hope helps to cope with uncertainty. The prototype analysis revealed that hope is a *belief that a positive future outcome is possible* combined with *a desire for that outcome*. We believe that our research provides a more nuanced understanding of hope and its associations with other constructs, and we hope that the current findings will contribute to future research on this important and intriguing topic.

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Appendix A

The Two Random Sets Used in Study 3

No.	Set 1	Set 2
	Central features	
1	thoughts	Imagination
2	bad situations where you are in despair	motivation
3	Loved ones	achievements
4	improvements	determined
5	possibility	positivity
6	strength	human
7	religious	desire
8	encourage	peace
9	freedom	cope with bad situations
10	faith	feelings
11	happiness	goals and plan
12	trust	future
13	love	expectation
	Peripheral features	
1	beauty	finance
2	fairness	commitment
3	assumption	needs
4	knowledge	active
5	helpful	naïve
6	being alive	education
7	good	effortful
8	outcome	truthful
9	calm	excited
10	change	unity
11	job and career	health
12	meaningful	self-confidence
13	waiting	uncertainty

(*Appendices continue*)

Appendix B

The 62 Neutral Words Used in Study 4

The 10 trial words			
Sand	Lady	Colleague	Application
Neck	Damage	Plastic	Plate
Writing	Start		
The 52 neutral words used in control condition			
State	Position	Art	Cup
Hand	Player	Teacher	Region
Part	Form	Rate	Television
Place	Author	Voice	Box
Case	Color	Season	Card
Week	Page	Paper	Seat
Point	Article	Site	Passenger
Room	Minute	Table	Mark
Area	Body	Phone	Chip
Eye	Face	Computer	Bike
Word	Number	Hair	Tea
Foot	Name	Window	Lake
Field	Town	List	Sand

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